I claim:

1. A magnetically enhanced plasma source apparatus comprising:

first and second surfaces with a gap between the surfaces, wherein the first surface comprises a substrate and wherein at least the second surface is connected to a power supply as a cathode;

a third surface connected to the power supply as an anode;

a magnetic field passing into both the first and second surfaces and through the gap between the surfaces, wherein at least a portion of the magnetic field passing through the substrate is at least two times stronger at the substrate surface than at the second surface along that field line and is strong enough to magnetize electrons; and

an electric field created by the power supply connected between the second surface and the third surface, wherein the electric field penetrates into an electron confining region of the magnetic field.

2. The invention of Claim 1, wherein the third surface also comprises the substrate.

3. The invention of Claim 1, wherein the first and second surfaces are contained in a chamber comprising grounded walls, and wherein the third surface is the grounded chamber walls.

4. The invention of Claim 1, wherein one of the substrate and the magnetic field is moved relative to the other.

5. The invention of Claim 1, wherein the second surface is covered by the substrate.

6. The invention of Claim 1, wherein the substrate is biased positively.

7. The invention of Claim 1, wherein the substrate is tied to ground.

8. The invention of Claim 1, wherein the substrate is left floating.

9. The invention of Claim 1, wherein the substrate is biased negatively.

10. The invention of Claim 1, wherein an AC voltage is used to bias the substrate.

11. The invention of Claim 1, wherein first and second surfaces are parallel.

12. The invention of Claim 1, wherein first and second surfaces are non-parallel.

13. The invention of Claim 1, wherein the substrate comprises a flexible web supported by a conveyor roll.

14. The invention of Claim 1, wherein the mirror field is shaped into a racetrack with the return field passing through the center of the racetrack.

15. A plasma source apparatus comprising:

at least two surfaces with a gap between the surfaces, wherein at least a portion of one of the surfaces is a substrate and wherein at least the non-substrate surface is connected as a cathode electrode;

a mirror magnetic field extending between the surfaces through the gap, wherein at least a portion of the magnetic field entering the substrate surface contains field lines at least two times as strong as those field lines entering the cathode electrode;

at least one anode structure disposed such that a closed loop electron Hall current containment region is formed within the mirror magnetic field, where upon with sufficient gas pressure and voltage between the cathode electrode and the anode structure, a plasma is formed in the containment region; and

wherein one of the substrate and the plasma is moved relative to the other.

16. The invention of Claim 15, wherein the substrate comprises a flexible web supported by a conveyor roll.

17. The invention of Claim 15, wherein the substrate is treated by the plasma with a treatment selected from the group consisting of: a chemical vapor deposition process, a sputter coating process, an ion etch process, and combinations thereof.

18. The invention of Claim 15, wherein the substrate containing surface is floating.

19. The invention of Claim 15, wherein the substrate containing surface is the anode.

20. A method of producing a plasma, comprising the steps of:

providing a plasma source inside a process chamber, said plasma source comprising first and second surfaces with a gap between the surfaces, wherein the first surface comprises a substrate and wherein at least the second surface is connected to a power supply as a cathode;

a third surface connected to the power supply as an anode;

a magnetic field passing into both the first and second surfaces and through the gap between the surfaces, wherein at least a portion of the magnetic field passing

through the substrate is at least two times stronger at the substrate surface than at the second surface along that field line and is strong enough to magnetize electrons; and

an electric field created by said power supply connected between the second surface and the third surface, wherein the electric field penetrates into an electron confining region of the magnetic field;

adjusting the pressure of said enclosed space between about 1 and about 100 mTorr;

introducing a process gas into said process chamber;

operating said power supply to impress a voltage between about 300 volts and about 2000 volts between said anode and said cathode;

forming a plasma between said cathode and said substrate, wherein the substrate is treated by the plasma with a treatment selected from the group consisting of: a chemical vapor deposition process, a sputter coating process, an ion etch process, and combinations thereof.